

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (Currently Amended) A method for designing a component for an industrial plant, in particular a thick-walled component for a power plant, by means of an iteration comprising the steps of
 - a) computing a plurality of process variables by means of a process simulator,
 - b) modelling growth of at least one hypothetical crack in the component, based on a structure of the component and the process variables,
 - c) computing a life expectancy for the component by determining a time required for a dimension of the hypothetical crack to exceed a given critical limit,
 - d) modifying the structure of the component,
 - e) repeating steps b) through d) until the time required for the crack dimension to exceed the given critical limit fulfils a pre-determined requirement,~~characterized in that~~ wherein
 - a time dependent load-profile and
 - a dynamic process simulator capable of modelling transient processbehaviour is used to compute the process variables.
2. (Currently Amended) The method as claimed in claim 1, ~~characterized in that~~ wherein
 - the process variables are re-computed by means of the process simulator each time the structure has been modified.

3. (Currently Amended) The method as claimed in ~~one of the previous claims,~~
~~characterized in that~~ claim 1, wherein

- stress exerted onto the component is computed from some or all of the process variables and

- is used as a driving force in modelling the growth of the at least one hypothetical crack.

4. (Currently Amended) The method as claimed in ~~one of the previous claims,~~
~~characterized in that~~ claim 1, wherein

- growth with time of a length a of the at least one hypothetical crack is modelled as creep crack growth according to $\frac{da}{dt} = \gamma(C_t)^m$, where C_t is a crack tip parameter that depends on the component geometry and a stress exerted on the component, γ a material creep constant, and m a component specific constant.

5. (Currently Amended) The method as claimed in ~~one of the previous claims,~~
~~characterized in that~~ claim 1, wherein

- growth per cycle of a length a of the at least one hypothetical crack is modelled as fatigue crack growth model according to
$$\frac{da}{dN} = \frac{C(\max(\Delta K - K_{th}, 0))^{n_{fatigue}}}{\frac{K_{crit}}{K_{max}} - 1},$$

where ΔK is an amplitude of a stress cycle, N the number of cycles and the remaining variables are component specific constants.

6. (Currently Amended) The method as claimed in ~~one of the previous claims,~~
~~characterized in that~~ claim 1, wherein

- the load profile contains at least one start-up or at least one shut-down of the power plant or.

7. (Currently Amended) The method as claimed in ~~one of the previous claims,~~
~~characterized in that~~ claim 1, wherein

- the load profile contains a plurality of load changes.

8. (Currently Amended) The method as claimed in ~~one of the previous claims,~~
~~characterized in that~~ claim 1, wherein

- the structure of the component is modified by modifying its material constitution or by modifying weld materials comprised by the structure.

9. (Currently Amended) The method as claimed in ~~one of the previous claims,~~
~~characterized in that~~ claim 1, wherein

- the computation of the plurality of transient process variables by means of the process simulator comprises a computation of tube temperatures and stress.

10. (Currently Amended) A computer program product comprising a computer readable medium, having thereon:

computer program code means that, when loaded onto a computer, make said computer execute the method according to ~~one of the claims 1 through 8~~ claim 1.